

**National Park Service
U.S. Department of the Interior**



**Aztec Ruins National Monument
New Mexico**

VEGETATION MANAGEMENT AND CULTURAL LANDSCAPE PRESERVATION PLAN FINDING OF NO SIGNIFICANT IMPACT

Aztec Ruins National Monument was established in 1923 to preserve a "ruin of great antiquity and historical interest." Over the subsequent 90 years the Monument has expanded from the original 4 acres to approximately 320. The majority of the expansion taking place since 1988. Much of this newly acquired property has been farmed and ranched for decades. Non-native invasive plants, including noxious weeds, have become established at Aztec Ruins National Monument, causing damage to Monument resources. Invasive species threaten cultural resources and compromise the structure, organization, function, and integrity of natural ecosystems. The Monument contains two significant cultural landscapes that are eligible for the National Register of Historic Places. Some of the existing vegetation does not contribute to or is incompatible with these cultural landscapes. Cultural resource values and visitor experience are diminished by these non-contributing and incompatible plants. The General Management Plan for Aztec Ruins National Monument (NPS 2011) recommends development of a combined Vegetation Management and Cultural Landscape Preservation Maintenance Plan to provide guidance and a decision-making framework on vegetation management and landscape preservation. The vegetation and cultural landscape management plans are being combined because vegetation plays an integral role in shaping, maintaining and preserving a cultural landscape.

An environmental assessment (EA) was prepared in 2012 to provide guidance and a decision-making framework on vegetation management and landscape preservation.

PREFERRED/SELECTED ALTERNATIVE

The preferred alternative, Alternative 2, Proactive Vegetation/Cultural Landscape Management, considers treatment of non-native vegetation using the entire tool box (mechanical, biological, cultural, prescribed fire, chemical) as well as restoration of vegetation and the cultural landscape. This will restore native plant communities, resulting in restoration of natural ecological processes, including native wildlife communities, riparian/floodplain health, water resources, and soil resources. It will also enhance visitor experience and help protect cultural resources that are the foundation of the Monument. By actively restoring appropriate vegetation, this alternative will also result in the restoration of the cultural landscapes.

MITIGATING MEASURES

The Mitigating Measures are attached.

ALTERNATIVES CONSIDERED

Alternatives considered included Alternative 1, No Action, which will maintain current management actions within the Monument; Alternative 2, (Preferred) Proactive Vegetation Management, which uses mechanical, biological, cultural, prescribed fire, and chemical; and Alternative 3, Limited Vegetation Management, which will have used only mechanical, biological, cultural, and prescribed fire.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative."

Alternative 2 (Preferred) Proactive Vegetation/Cultural Landscape Management, is the environmentally preferable alternative for several reasons: (1) Minimize past and future damage and prevent impairment to cultural resources from vegetation or lack thereof; (2) Prevent the spread of non-native and/or invasive species and the introduction of new non-native species; (3) Improve the condition and integrity of the Ancient Aztec Community and Historic District landscapes where possible through vegetation management; (4) Educate and involve Monument neighbors and the public to enhance understanding and support for a sustainable vegetation management program; (5) Protect, restore, rehabilitate, and revegetate to a self-sustaining (natural) native regime that is compatible with the Ancient Aztec Community landscape; (6) Restore, rehabilitate, and revegetate agriculturally disturbed areas to a self-sustaining native regime; (7) Protect and enhance, when feasible and appropriate, areas within Aztec Ruins that are dominated by native species from additional impacts; (8) Improve health and safety and reduce liability issues through vegetation management; (9) Define priorities for cultural landscape treatments; (10) Improve the condition and integrity of the Ancient Aztec Community and Historic District landscapes where possible; (11) Pursue partnership opportunities as feasible to improve vegetation management within the Monument and across administrative boundaries.

WHY THE PREFERRED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT ON THE HUMAN ENVIRONMENT

Impacts that may be both beneficial and adverse. A significant effect may exist even if the agency believes that on balance the effect will be beneficial.

Implementation of the preferred alternative, Alternative 2 Proactive Vegetation/Cultural Landscape Management, will result in many beneficial impacts to the cultural and natural resources, visitor experience and educational opportunities. Removal of the pear and apple orchard west of West Ruin within the Ancient Aztec Community Landscape will benefit visitor experience, native vegetation, and wildlife. This alternative will restore native plant communities, resulting in restoration of natural ecological processes, including native wildlife communities, riparian/floodplain health, water resources, and soil resources. It will also enhance visitor experience and help protect cultural resources that are the foundation of the Monument. By actively restoring appropriate vegetation, this alternative will also result in the restoration of the cultural landscapes and therefore, maximally meet the desired conditions.

In addition to these beneficial impacts, some adverse impacts will occur; however, these impacts will be negligible to minor and will be substantially outweighed by the benefits.

Degree of effect on public health or safety

The application of herbicide will be primarily in units of the monument that are closed to public use. Within the units of the monument that receive visitor use, herbicide use will be limited and more directed on individual plants. Wind direction will be taken into account during all herbicide use. This will result in negligible to minor adverse effects.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas

The preferred alternative, Alternative 2 Proactive Vegetation/Cultural Landscape Management, will have minor, beneficial effect on historic structures that are prehistoric in age in and have no effect on non-prehistoric historic structures. Possible impacts from mechanical plant removal will be mitigated through monitoring and implementation of techniques that cause little disturbance. Any identified appropriate use of chemical/herbicide applications for the control of non-native weeds will follow all proper application measures.

Degree to which effects on the quality of the human environment are likely to be highly controversial.

During the planning phase of the project there was some concern expressed by a few community members about the removal of what may have been an historic orchard. Research was completed that determined that the orchard was not historic and the fruit was a common variety. No comments were received in the public comment period about the EA.

Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks

There were no highly uncertain or unique or unknown risks identified.

Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration

The project will not establish a precedent for future actions with significant effects. The activities taken in this plan are typical actions both within the National Park Service, other Federal and State agencies, and on private lands for revegetation projects. There are no actions that would deviate from normal routine vegetation management activities.

Whether the action is related to other actions with individually insignificant but cumulatively significant impacts

Cumulative effects were analyzed in the environmental assessment and no major (significant) cumulative effects were identified.

Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

There are two cultural landscapes, the Ancient Aztec Landscape and the Aztec Historic District Landscape, identified at Aztec Ruins National Monument that have been determined to be eligible for the National Register of Historic Places.

Overall, there will be minor to moderate, beneficial effects on the two eligible cultural landscapes with the restoration of the natural environment, including revegetation and the removal of non-native vegetation. This alternative, Alternative 2 (Preferred) Proactive Vegetation/Cultural Landscape Management, will have minor, beneficial effect on historic structures that are prehistoric in age and have no effect on non-prehistoric historic structures. Possible impacts from mechanical plant removal will be mitigated through monitoring and implementation of techniques that cause little disturbance. Any identified appropriate use of chemical/herbicide applications for the control of non-native weeds will follow all proper application measures.

Regrading, scarifying, and revegetating dirt roads will include subsurface disturbances that could range from minor to moderate, and adverse to buried prehistoric resources, but good planning, archeological monitoring, and mitigation (e.g., documentation) will keep impacts within minor level. Recontouring and regrading in both Core Cultural Area and Upland Zone has potential to cause moderate, adverse effects through surface disturbance. However, impacts can be mitigated to below the moderate threshold by avoiding significant surface archeological features and conducting archeological monitoring. Short-term impacts from treatment

procedures will be avoided through selection of minimally invasive procedures and mitigated through archeological monitoring and documentation.

A park archeologist reviewed the plan and determined there were no adverse effects, in regards to Section 106. On December 21, 2012 the SHPO concurred with the determination of no adverse effects.

Degree to which the action may adversely affect an endangered or threatened species or its critical habitat

The U.S. Fish and Wildlife Service concurred with the determination of no effect on threatened or endangered species in their letter dated August 22, 2012

Whether the action threatens a violation of Federal, state, or local environmental protection law

This action violates no federal, state, or local environmental protection laws.

PUBLIC INVOLVEMENT

A public scoping brochure was disseminated on January 22, 2008 to stakeholders. Three responses were received, two supporting Alternative 3 and one supporting Alternative 2 (Preferred Alternative). A scoping letter was sent out to all consulting tribes on January 23, 2008. Three responses were received, two supporting Alternative 3 and one supporting Alternative 2 (Preferred Alternative).

The environmental assessment was made available for public review and comment during a 30-day period ending November 22, 2012. No comments were received.

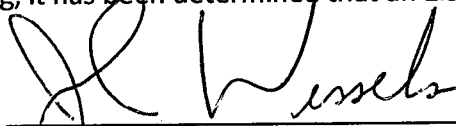
The final draft of the Plan/EA was mailed out to all tribal consultants on January 9, 2013. Two comments were received. The Hopi supported Alternative 3, Limited Vegetation/Cultural Landscape Management, while the Navajo supported Alternative 2, Proactive Vegetation/Cultural Landscape Management.

CONCLUSION

As described above, the preferred alternative, Alternative 2, Proactive Vegetation/Cultural Landscape Management, does not constitute an action meeting the criteria that normally require preparation of an environmental impact statement (EIS). The preferred alternative will not have a significant effect on the human environment. Environmental impacts that could occur are limited in context and intensity, with generally adverse impacts that range from localized to widespread, short- to long-term, and negligible to moderate. There are no unmitigated adverse effects on public health, public safety, threatened or endangered species, sites or districts listed in or eligible

for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law. Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

Approved:



John Wessels, Regional Director,
Intermountain Region, NPS

2/25/13
Date

Mitigation Measures

The following mitigation measures will be used to minimize the effects of preservation and restoration activities and will be adhered to during implementation of the preferred alternative:

- *All work will be conducted using best management practices and planned with the best available science.*
- *All work will be led by National Park Service professionals trained in historic preservation and restoration ecology. The Monument's cultural resource manager/archeologist and natural resource specialist will coordinate the project and monitor all disturbance activities.*
- *To minimize the potential impacts from personnel and equipment, the following general mitigation measures will be implemented under both alternatives.*

General

- *Equipment will use existing roads and trails to the maximum extent practical.*
- *Herbicides will be applied by backpack sprayers or hand sprayers.*
- *Herbicides will be applied according to application rates specified on the product label.*
- *Hand tools will be primarily used and only where hand tools are not feasible, chainsaws may be used.*
- *Equipment used for exotic plant management will be washed prior to entering a park to reduce the potential for accidentally introducing exotic plants from another area.*
- *Use of equipment in high visibility areas will be avoided to the extent feasible.*
- *The number of vehicle and equipment passes off-road (only on a case by case basis) will be minimized to the extent possible.*
- *NPS policy requires that only herbicides that are expected to be used in a 1-year period can be purchased at one time. Therefore, herbicides will not be stored for periods greater than one year. Herbicide efficacy is lost over time.*

Air Quality

- *Reduced application rates of herbicides will be used wherever possible. Reduced application rates are often more effective than higher application rates because translocation is enhanced prior to loss of physiologic function. Higher rates may burn off leaves and reduce translocation.*
- *Herbicide application will account for meteorological factors such as wind speed, wind direction, inversions, humidity, and precipitation in relation to the presence of sensitive*

resources near the treatment area and direction provided on labels. Herbicides will only be applied when meteorological conditions at the treatment site allow for complete and even coverage and will prevent drifting of spray onto non-target sensitive resources or areas used by humans.

Soils

- Vehicles used for control will avoid wetland areas with standing water or saturated soils, to the extent practical and will be operated to minimize disturbance to soils.*
- Personnel and equipment will avoid areas having sensitive biological soil crusts, especially those including colored lichen, or areas that are prone to erosion.*
- Off-road vehicles will not be operated where there are well-developed soil crusts, especially where there are mature soil crusts including colored (yellow, white, red, green, brown or blue) soil lichens.*
- Damage to soils will be minimized by using existing access routes, when possible, avoiding sensitive biological soil crusts, especially those including colored lichens.*
- Type of mowing equipment will be selected based on the patch size, density of the target species, and terrain and condition of biological soil crusts. Large, dense patches are suitable for vehicle-drawn mowing equipment, while small, dispersed patches are more suitable for control with hand-held equipment, such as a weed-whip.*
- Hand raking will be used in smaller-scale sites if there are potential impacts to desirable vegetation or soil crusts.*
- Where soil destabilization is not desired, the full removal of root systems will not be employed.*
- Herbicides with longer persistence will be applied at lower concentrations and with less frequency to limit the potential for accumulation of herbicides in soils.*
- When and where appropriate, soil amendment practices may be implemented. NPS (2006) requires that if off-site soil or soil amendments are used that removal of these soils and amendments should not disturb pristine sites. The use of soil amendments and fertilizers will not unacceptably affect the biological, chemical or physical characteristics of the soil.*
- When temporary impacts associated with restoration activities are expected to disturb soils, the following materials may be used to reduce erosion and to retain top soils: silt fences, sand bags, wood excelsior, and weed-free or sterilized straw. When and if these materials are used, they will be inspected at least weekly, or as weather requires (e.g., after major storms) for condition and maintenance.*

Wildlife

- *The National Park Service will ensure that all preservation and restoration workers and supervisors are informed about wildlife values and regulations.*
- *Preservation and restoration activities will be scheduled to minimize impacts to wildlife to the greatest extent possible. Vegetation will be checked before chemical treatments for presence of wildlife, including nests, dens, and burrows. The Migratory Bird Treaty Act (1918) prohibits the take of nests, eggs, and nestlings; therefore, chemical treatments will be timed to avoid such take where nests are detected.*

Native Vegetation

- *Exotic plant management activities will only be used where necessary to promote the reestablishment of native plant communities.*
- *Eradicated trees can be chipped and used for mulch to control soil erosion and to retain local nutrients.*
- *To minimize the amount of ground disturbance, staging and stockpiling areas will be located in previously disturbed sites, away from visitor use areas to the greatest extent possible. Existing native vegetation at the site will be undisturbed to the greatest extent possible.*
- *All mowing activities will be timed so that they are performed before there is a danger of contributing to the spread of viable seed.*
- *Cut plant material will be removed from the site if it may prevent establishment/growth of desirable vegetation and appropriately transported and disposed of in a way so that no propagules are spread. If plant material can or must be left, it will be piled or scattered in a way that it does not re-root or interfere with desirable vegetation.*
- *Re-vegetation will be implemented as quickly as possible to large areas of bare soil to reduce the danger of erosion caused by any loss of vegetative cover. Small areas that are adjacent to healthy native vegetation will be allowed to recover naturally, whenever possible.*
- *Selection of restoration species will be limited to native species that exist naturally in the region to prevent the accidental introduction of new exotic species. To minimize genetic contamination, propagules will be collected or propagated from the closest sites possible, as long as the collection site remains healthy and resilient to future disturbance. The benefits of local propagule collection must be weighed against the need for prompt revegetation. In many cases it may be more important to prevent establishment of non-desirable species and stabilize soils than to wait for sufficient seed to be collected locally.*
- *To limit the potential for equipment to spread exotic plant seeds, treatments should be completed before seed becomes viable.*

- *Planning will be utilized to assure that appropriate seed is available at the necessary time, and local collections will be prioritized based on available information concerning each species' genetic site-specificity.*
- *Parks will identify traditional use plants based on consultation with tribes.*
- *Traditional use plants are plants used or held sacred by Native American Tribes for medicinal, ceremonial, religious, or other cultural purposes.*
- *NPS staff will receive training on identification of traditional use plants and will avoid treating non-target plants to the extent feasible.*
- *Mechanical methods such as tilling will not be used in areas where traditional use plants are known to occur or have the potential to occur.*
- *Herbicides will be selected and BMPs will be implemented to maximize the effectiveness of the treatment on the target exotic plant and to minimize the potential effects on non-target plants.*
- *Herbicides will be applied as near to the target plant as possible.*
- *Herbicides will be applied at the appropriate time based on the herbicide's mode of action. Poor timing of application can reduce the effectiveness of herbicides and can increase the impact on non-target plants.*

Water Resources (including wetlands and floodplains)

- *If drought conditions are forecasted, resource managers should delay the purchase and planting of shrubs to avoid the need for irrigation. Resource managers should also confirm that there is water available for irrigation should the need arise.*
- *Vehicles are only permitted on established roads and will not be driven up or down stream channels. The number of vehicles will also be minimized to the extent possible.*
- *Applications of herbicides will be avoided during periods and in areas where seasonal precipitation or excess irrigation water is likely to wash residual herbicides into waterways.*
- *Only herbicides that are registered for use in or near water will be used in those areas.*
- *Only those herbicides that have a low potential toxicity, such as glyphosate (Roundup Pro and Rodeo) will be used within areas near surface waters or in areas with a high leaching potential. Glyphosate is strongly adsorbed into soil, with little potential for leaching to ground water. Microbes in the soil readily and completely degrade it even in low temperatures. It tends to adhere to sediments when released to water and does not accumulate in aquatic life (Forest Service 2004).*

- *Herbicides with high soil retention will be used in areas where there is potential to affect surface water or ground water resources.*

- *As needed to protect the efficacy of the herbicide, water will be buffered, depending on hardness, pH, and other factors.*

Highly water-soluble herbicides will not be used in areas where there is potential to affect surface water or ground water resources.

- *Herbicides with high volatility will not be used to treat areas located adjacent to sensitive areas because of the potential for unwanted movement of herbicides to these areas.*

- *In areas where there is the potential to affect surface water or ground water resources, herbicide pH and soil pH will be considered to select the herbicide with the lowest leaching potential.*

Cultural Resources

- *Surface disturbing activities, such as tilling or use of heavy equipment, will be avoided with the boundary of known or potential cultural resource or historic sites.*

- *Areas that may contain cultural resources and that have not been previously studied but may contain these resources will be surveyed or avoided. All surface disturbing activities such as digging, pulling, and tilling, will be avoided in areas where cultural resources are identified or known to occur. In the event that cultural resources are encountered during manual or mechanical treatments, work will stop immediately and will not continue until the site can be evaluated and cleared by the staff archeologist.*

- *Consultation with resource managers during planning phase of exotic plant management projects is required to determine sensitive areas and acceptable levels of disturbance.*

- *Equipment used for re-vegetation and restoration projects will be evaluated and chosen that is determined to be the most effective to accomplish restoration goals while causing the least disturbance to cultural resources.*

- *Weed management personnel will be briefed about working in a protecting cultural resource sites.*

- *Vehicle traffic will be limited to roads to protect vulnerable cultural resources.*

- *To reduce impacts of park personnel on cultural resources, crews will follow field SOP's, such as stay on trails and work in small teams.*

- *Burn piles will not be constructed within 100 feet of known cultural resources.*
- *Should preservation and/or restoration activities result in unearthing previously undiscovered cultural resources, work will be stopped in the area of any discovery and the park will consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) will be followed.*
- *The National Park Service will ensure that all workers are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites and historic properties. Workers will also be instructed on procedures to follow in case a previously unknown archeological resource is uncovered during construction. Preservation and restoration workers and supervisors will be informed about the special sensitivity of the Historic Site's values and regulations.*

Human Health and Safety

- *Use of appropriate personal protective equipment PPE will be used when implementing control techniques.*

All SOP's will be reviewed and followed prior to implementation.

- *All herbicide labels will be followed to ensure that proper application is used in a safe manner.*
- *A Job Hazard Analysis for herbicide application will be reviewed prior to implementation.*
- *Signs will be posted to inform visitors of chemically treated areas. Chemically treated areas will be temporarily closed off to visitors. All federal, state, and local regulations regarding herbicide use will be followed at all times.*
- *All product labels will be read and followed by herbicide applicators. It is a violation of federal law to use an herbicide in a manner that is inconsistent with its label.*
- *Herbicide applicators will obtain any certifications or licenses required by the state and/or county.*
- *A construction zone for installation of the buried utility lines, as well as staging areas and work zones will be identified and demarcated with construction tape or some similar material prior to any preservation or restoration activities. The tape will define the zone and confine the activity to the minimum area needed for implementing the project. All protection measures will be clearly stated in the construction specifications, and workers will be instructed to avoid conducting activities beyond the zone as defined by the fencing. In addition, the National Park Service will ensure that all workers are informed that damage to resources outside the scope of work is subject to prosecution, fine, restitution costs, and other penalties.*

Visitor Use and experience

- *Preservation and restoration activities will be scheduled to minimize preservation and restoration impacts upon visitors.*
- *Areas not under construction will remain accessible to visitors as much as is safely possible.*
- *Park visitors will be informed via interpretive brochures of any on-going vegetation management or restoration activities.*
- *The efficacy of all mitigation measures will be monitored and adjusted if needed, using best management practices, adaptive management practices, and best available science.*